USAID Water Team

Integrated Water Resources Management

A Framework for Action in Freshwater and Coastal Systems

April 2002

This report was prepared by the U.S. Agency for International Development (USAID) Water Team. Photos are courtesy of K. Chernush, Meg Findley, the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), the National Renewable Energy Laboratory (NREL), the Smithsonian Institution, the Water and Sanitation for Health (WASH) Project, and Winrock International.

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A Message from the Environment Center

Water impacts people's daily lives in a myriad of ways.

SOMEWHERE on earth, a mother awakens before dawn to collect water, prepare breakfast, and begin the day's chores. A thousand miles away, a textile factory churns out the day's production, and hundreds of workers come and go from the informal settlements where they live. Elsewhere, a farmer tills her field and hopes for rain, while another opens an irrigation valve to water his thirsty crops. A hotel developer plans a new beach resort as the village fisherman prepares his nets for the day's catch. Each day around the world, millions of such individuals, families, and businesses engage in myriad acts of water resources use and management, with a mixed set of outcomes for the planet and each other.

Sustainable development depends on water. USAID's strategic goals of promoting economic and agricultural development, protecting human health, preventing conflict, and safeguarding the environment all demand much better water resources management than has taken place in the past. Because water is fundamental to economic and social progress and critical to the health of the earth's ecosystems, USAID has always worked in the sector, and has bettered the lives of thousands of people all over the world through its water-related investments. Increasing pressures on

water from population growth, pollution, and economic production are exacerbating old problems and threatening to create new crises that will demand that the Agency be more effective and strategic in its approach to managing this precious shared resource.

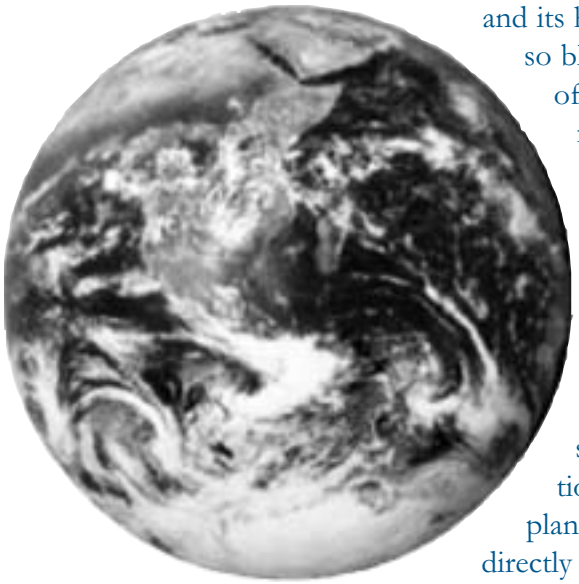
In the past decade, the international community has reached a consensus that integrated water resources management is the most sustainable response to the economic, ecological, and health threats posed by degraded and overdrawn water resources. This integrated approach uses cross-sectoral planning and participatory decision making to value water accurately and to design broadly supported management systems at local, regional, national, and transboundary scales.

This document outlines the need for more integrated water and coastal resources management within USAID and proposes a framework to support both new and ongoing programs. It also describes opportunities for collaboration with USAID's Water Team, a team that includes members from Pillar Bureaus, Regional Bureaus, other USAID/Washington offices, and field Missions. We look forward to your comments and the chance to work with you soon.

Economic and social development depends on water.

Franklin Moore
Acting Deputy Assistant Administrator for Environment
Bureau for Economic Growth, Agriculture and Trade

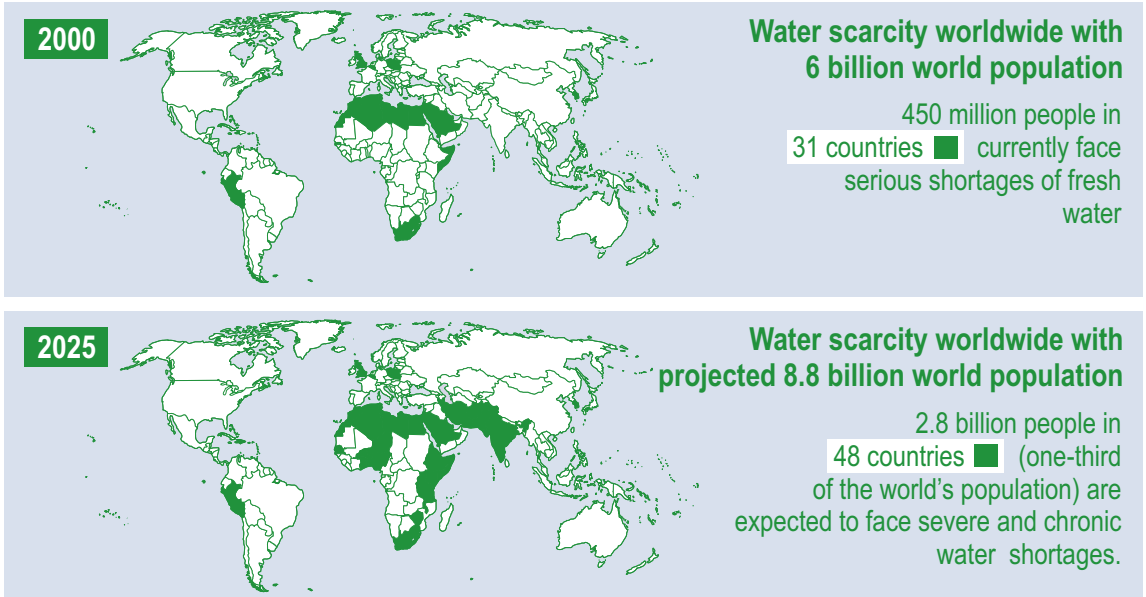
The Blue Planet



THE image of the "Blue Planet" as seen from space forever changed the way we see the world, exposing at once the awesome beauty and fragile unity of our global environment and its human inhabitants. Of course, the earth appears so blue from a distance because of the vast amount of water that spans its oceans, courses through freshwater bodies, and saturates its atmosphere. As the lifeblood of the biosphere, water circulates through the system with a power that shapes the earth's surface and fuels the processes that sustain all living systems.

Down here on earth, the image of a single planet is often lost, as people understandably focus on more immediate concerns for survival and local well-being, including their relationship to water. Although we have a water-rich planet in many ways, the amount of freshwater directly available for human use represents only 0.01 percent of all the moisture in the system. Furthermore, this water is not evenly distributed in space or time, or necessarily located where the largest concentrations of people reside. Specific regions are plagued with problems of freshwater scarcity and drought or oversupply and flooding. In fact, 450 million people in 31 countries already face serious shortages of freshwater. By the year 2025, 2.8 billion people in 48 countries (one-third of the world's population) are expected to face severe and chronic water shortages. Exacerbating the problem, the planet's limited freshwater resources are often contaminated by human activity and made unavailable for further use by people or for the healthy maintenance of ecosystems.

At the other extreme, countless people have been affected and billions of dollars worth of property damage have been caused by storms and flooding in recent years in the developing countries of the world. In 1998 alone, an estimated 32,000 people worldwide were killed and another 300 million more were displaced from their



homes because of severe weather events. Finally, while freshwater is certainly of great concern, in fact most of the water on earth resides in the seas and oceans. These resources are also under threat, not from scarcity, but from the impact of a broad range of human activities. Coastal systems are particularly vulnerable to degradation from land-based activities, climate change, and exploitation of living resources.

A Secure Water Future

THE issues surrounding water have risen in international importance since the early 1990s, with major statements of the global community issued in Dublin (1992), Rio de Janeiro (1992), and Marrakech (1997). In March 2000, the Second World Water Forum in The Hague reiterated the call to action, and encouraged nations around the world to work together to achieve "water security in the 21st century."

We All Live Downstream: *Water is a resource that by its very nature "flows" through our landscape, spanning from one geographic area to another, connecting distinct ecosystems, and juxtaposing different sectors of human activity. Linkages with water resources management are apparent in many of the program areas in which USAID is active, as illustrated on the following pages.*

International Statements on Water Resources Management

FOR further information on international statements on water resources management, see:

- ***The Dublin Principles (Dublin, 1992)*** (http://www.wmo.ch/web/homs/icwedece.html)
- ***Agenda 21 - Articles 17 and 18 (UNCED, Rio de Janeiro, 1992)*** (http://www.igc.apc.org/habitat/agenda21/index.html)
- ***The Hague Declaration (World Water Forum, The Hague, 2000)*** (http://www.worldwatervision.org)

Human Health: *Despite prolonged efforts, the percentage of people without access to potable water and sanitation is still alarmingly high in both rural and urban areas. Worldwide, the health of more than 1.2 billion people is at risk because they lack access to clean water. Annually, the world's population suffers about 4 billion episodes of water-related diarrhea, causing widespread debilitation and reduced productivity throughout the developing world. An estimated 2.5 million people die from such diseases each year, primarily children under five.*

By focusing on "security," the Hague Declaration recognizes the many ways that water is necessary to ensure the safety, sustainability, and prosperity of our Blue Planet and its inhabitants. It also acknowledges that we are entering a century in which many different kinds of water crises will threaten security, from the individual level to the geopolitical arena. The Hague definition of water security further makes clear that no single use of water can be adequately addressed without simultaneously considering the full range of needs: Water and sanitation for health, water for food security, water for economic development, and water for nature all must be given adequate attention for security to be achieved.

Worldwide, a commitment of additional resources will be necessary to ensure that even the most basic needs for water are met in the coming decades—for people, for food, and for nature. In addition, achieving a water-secure future for all the earth's human residents and natural systems will require a much different way of doing business. Historically, water management has tended to compartmentalize the human relationship to water resources by considering each activity and use separately. Water for irrigation, for drinking, for waste management, for industrial activity, for navigation, or for energy production have all been treated as distinct political, economic, or management issues, without a deep appreciation of the funda-

mental linkages among them or the enormous ripple effects that can occur upstream and downstream. As we guide our human activities—for all social groups, in all use sectors, and across multiple spatial scales—our challenge is to keep in mind the image of the single Blue Planet as a guiding principle for a more integrated and holistic relationship with fresh and marine water resources. This can inspire creative solutions and can transform our relationship with water in profound and lasting ways.

Water and food security are closely intertwined.

Food Security: *Food production from agricultural crops, livestock, and fisheries is completely dependent on predictable and high-quality supplies of fresh or marine water. Approximately 80 percent of all freshwater consumed on the planet is devoted to agricultural production, often in irrigated systems that are inefficient and environmentally unsustainable. Living aquatic resources harvested from both freshwater and marine ecosystems, including aquaculture systems, supply 15-20 percent of the animal protein consumed worldwide. The growing global population will demand even greater agricultural and aquacultural productivity in the future. Creative solutions will be needed to address world food security without degrading or depleting terrestrial or aquatic ecosystems.*

The USAID Response: A Blue Revolution

USAID shares with other U.S. government agencies a common goal to provide national and international leadership in advancing a holistic approach to water resources management. As part of this effort, the Agency is working to actively promote the concept of integration through a "blue revolution" in its programs around the world. Integrated water resources management (IWRM) fits in with the overall USAID ethic of sustainable development as it challenges us to find connections among multiple needs and approaches to more effectively meet the challenges of poverty, a degraded environment, and inadequate democratic structures. Indeed, all the major goals of the Agency are affected by an integrated approach to water resources management: achieving broad-based economic growth and food security, building sustainable democracies, developing human capacity, improving human health, protecting the environment, and providing humanitarian assistance.

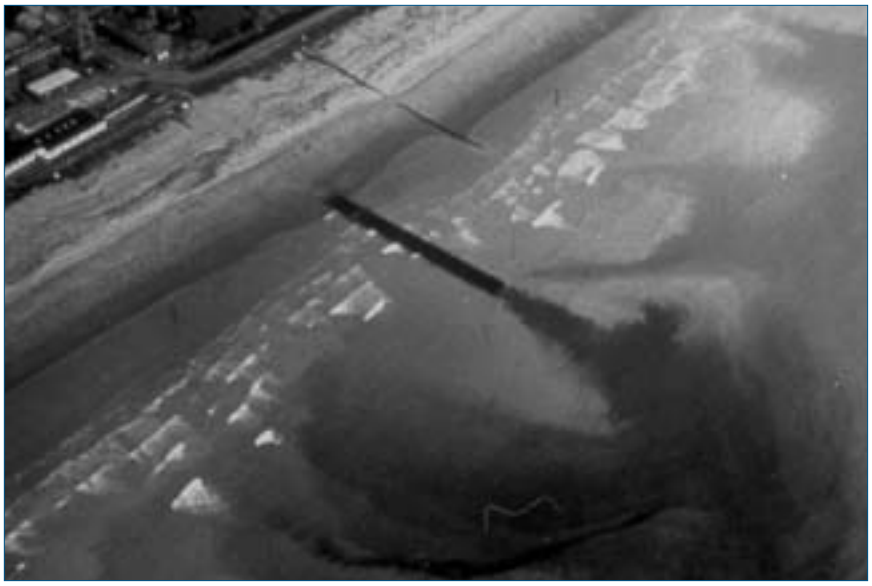
Ecosystem Health: *The freshwater and marine hydrologic cycle serves vital ecological functions beyond the provision of freshwater as a commodity for human use. Habitats such as wetlands, forested watersheds, estuaries, and riparian environments sustain biodiversity, moderate floods and droughts, filter contaminants, form the foundation of coastal and aquatic food chains, and provide other diverse ecosystem services. These systems are rapidly being disrupted and destroyed by unconstrained development and exploitation. Aquatic ecosystems are under the greatest threat of all ecosystems on the planet, with coastal and marine environments especially subject to severe impacts of dense human settlement.*

Integrated Water Resources Management: A Model for Global Water Security

IN recent years, water management institutions around the world have embraced the fundamentally interconnected nature of hydrological resources by promoting integrated water resources management as an alternative to the dominant sector-by-sector, top-down management style of the past. What exactly does this notion of "integrated" management mean, and how does it differ from what has been done in the past? The ways that IWRM can be translated into practice are becoming increasingly crystallized within the international community and include such practices as:

- management of water resources at the basin or watershed scale, including the integration of land and water, upstream and downstream, groundwater, surface water, and coastal resources;
- integration of both supply-side and demand-side approaches, including:
  - supply optimization, including assessments of surface and groundwater supplies, water balances, wastewater reuse, and environmental impacts of distribution and use options; and
  - demand management, including cost recovery policies, water use efficiency technologies, and decentralized water-management authority;
- an intersectoral approach to decision making, combining authority with responsibility for managing the water resource;
- improved and integrated policy, regulatory, and institutional frameworks, such as the implementation of the polluter-pays principle, water quality norms and standards, and market-based regulatory mechanisms; and
- equitable access to water resources through participatory and transparent governance and management, including support for effective water users associations, involvement of marginalized groups, and consideration of gender issues.

While in the past individual project managers have sometimes promoted a broad view and applied aspects of IWRM in their work, the widespread and systematic application of these principles at the design and planning stages of water-related projects is much more recent, with results on the ground still quite new in many places. This receptivity has been coupled with the development of a core set of IWRM approaches and best practices that have been shown to work on the ground. IWRM is also "new" in the broad degree of international acceptance it has now garnered, and the recent willingness of many water management institutions and decision makers to put in place the policies, laws, and institutional structures necessary to support such approaches.



Economic productivity impacts water resources.

Poverty Alleviation and Economic Growth: *In all cases, water resources problems disproportionately affect the poor, who suffer most of the adverse impacts of water scarcity, overabundance, or contamination. Getting out of poverty also requires water. A dependable and clean water supply is critical for every kind of economic development, ranging from primary sector activities (agriculture, forestry, and mining) to industrial production, energy generation, or service sector development. Increasingly, different human activities are competing for limited water supplies that are critical to sustaining human livelihoods and economic productivity.*

Historically, USAID has directed substantial resources toward various aspects of water resources management, reaching a total of at least $11 billion over the last 30 years, and well over $400 million annually in recent years. Many extremely valuable investments have been made to improve access to safe and adequate water supply and sanitation, improve irrigation technology, enhance natural environments, and develop better institutional capacity for water resources management in countries around the world. The way in which these programs have been designed and implemented has often been along traditional sectoral lines: agriculture/irrigation, public health/water supply and sanitation, urban development, economic development, habitat protection and biodiversity. While integration has certainly occurred in specific cases, it is only in recent years that the Agency has explicitly attempted to build bridges across different sectors working in the area of water resources management. A practicable form of IWRM is being promoted to permit synergies and achieve more effective, efficient, and lasting outcomes. In short, USAID is striving to become more strategic in how it manages its investment in the area of water resources management.

Risks and Disaster Management: *Hurricanes, tornadoes, floods, and droughts cost many thousands of lives and many billions of dollars each year. The marine systems that cover three-quarters of the earth's surface are vital drivers of meteorological and hydrological cycles, with implications for the physical safety of millions of people who suffer from droughts and floods annually. Changes in land use, such as urbanization or the clearing of forests, can reduce water quality and threaten human populations by exacerbating the impacts of seasonal flooding and drought. Global climate change may increase the variability and unpredictability of weather patterns and extreme events. Losses can be mitigated by planning, sound development, monitoring, and preparedness.*

A Step-Wise Approach

USAID Missions have decades of valuable experience in water resources management. Embracing an IWRM perspective does not mean abandoning all activities that have focused on a single sector, or directing resources away from specific, individual worthwhile activities in the area of water management. It also does not mean that an "all or nothing" approach to integration is the only—or even the best—way to get results. Rather, a holistic approach appreciates that the whole is made up of important, vital parts that must be acted on as the opportunities and constraints of the situation allow.

The integrated approach further suggests that most sector-specific projects and concrete actions can benefit from a broader perspective and an understanding that the underlying causes for water

The USAID Water Team

THE Water Team was formed to support environmentally sound, cross-sectoral and participatory approaches to managing, conserving, and sustainably using freshwater and coastal resources. Core staff of the Team are located within the Economic Growth, Agriculture and Trade (EGAT) Bureau's Environment office, but the Team has involvement from across the Agency. Currently, members hail from several programs within the Pillar Bureaus, as well as from regional Bureaus. In addition, the Team welcomes "virtual" members from Missions around the world to participate via an e-mail network, by periodic exchange and interaction with Washington staff, and through their pioneering and innovative work in the field.

Reaching out to involve professionals throughout the Agency maximizes the strengths of both Washington and the field. The practice of IWRM is developed and refined in the real-world settings of regional and country Mission programs. The EGAT Environment office staff serves as a repository and clearinghouse for both the wealth of USAID experience and other information on cutting-edge practices from water professionals throughout the world. The Team in Washington is charged with disseminating this information throughout USAID, as the Agency evolves in its own understanding of the theory and practice of IWRM.

crises are complex and involve numerous, interrelated factors and forces. Exploring creative ways to link program areas can greatly increase the effectiveness of these efforts. Although a reorientation of program activities toward a comprehensive integrated water management activity will only be possible in some cases, the principles and process of IWRM can contribute positively to what is being done in all water-related programs.

The USAID Water Team

WHILE it is often a challenge to change old ways of doing business, there is growing interest in applying the concepts of IWRM throughout USAID. The USAID Water Team, including representatives from throughout the Agency, acts as a principal agent of change as we develop models of IWRM that work in the real-world context where the Agency operates. Environment staff from the Economic Growth, Agriculture and Trade Bureau work to support such efforts on a full-time basis.

How to move from sectoral management of the resource to a more integrated approach remains a challenge everywhere, including within the Agency. USAID has already had some good results in this area and is continually expanding its toolbox of valuable resources, information, and guidance to support practical, step-wise approaches to enhance integration in both current and new activities.

Fishing nets clog a river.

Democracy and Governance: *Control over and access to water resources is often linked to questions of local, regional, national, and international political and financial decision making. As in many areas of natural resource management, models of community-based governance involving all stakeholders are central to sound water resources management. The increased involvement of the private sector in partnership with civil society and government will also be required to solve the water resources management problems of the 21st century.*

A Framework for Action

THE USAID Water Team operates within a Framework for Action that takes a three-pronged approach to promoting more sustainable and integrated management of water resources.

Technical and Managerial Support to Missions and Regions

By far, providing support and services to USAID Missions is the centerpiece of the Team's work. The intersection of a coherent process of governance and planning, executed with technical capacity and good science, provides the best basis for sustainable management of water resources. The Team is available to assist field Missions in their work in many ways, including:

- direct involvement of Team members in strategic planning, program review, or technical assistance on specific projects;
- implementation of field activities in the area of integrated coastal management in several countries around the world, through implementing partners available through Water Team procurement mechanisms; and
- managing the Water IQC procurement mechanism, available to assist Missions in implementing innovative water projects.

Women in Development: *Women play an especially important role in achieving a sustainable water future in urban and rural areas alike, as they often have primary responsibility for supplying the family's basic needs for water and for caring for family members sickened from poor sanitation. The time women now spend on these tasks is time stolen from potentially productive activities that can help families everywhere rise from the cycle of poverty.*

Clearinghouse and Outreach Services

The Water Team also serves an important role as a central repository for technical expertise and experience from around the world in water resources management, and as an efficient channel of that information to the practitioners in the field who can make the best use of it. We are building a network of international contacts in IWRM and other areas, increasing coordination with other programs within USAID, and collecting documentation to support work in the field in a range of technical areas.

Specifically, the Team offers various services, including:

- developing technical materials and resources on a variety of water resources management topics;
- conducting research and analysis on topics of interest to Missions and programs;
- compiling and analyzing USAID's experience in water resources, and communicating this information to missions and the international community; and

An urban slum lacking adequate environmental infrastructure.

- developing materials and information that build linkages between water management and other areas of development interest, including human health, urban development, democracy and governance, energy, biodiversity, and forestry.

Global Partnership and Leadership

USAID can maximize its positive impact through strategic coordination and partnership with numerous other institutions working in the area of water resources management around the world. Such partnerships permit the Agency to stay abreast of advances in the field and take advantage of opportunities for productive collaborations on specific projects or on a wider policy agenda.

The Team serves this function through such activities as:

- membership in a U.S. government interagency working group on international water resources management issues;
- participation in international forums on water management, including the World Water Forum, the 2002 World Summit on Sustainable Development, and Global Water Partnership meetings;
- collaboration with the U.S. Department of State in advancing transboundary river basin management; and
- continuing inter-institutional relationships with other donors, NGOs, professional associations, and private firms active in the field of water management.

Urban Development: *A more urban and industrialized population in this century will require greater supplies of water and place further stress on this scarce resource and the environment in general. By 2005, half of the world's population will live in urban areas, greatly increasing the demand for potable water and sanitation in cities. By 2025, that figure will rise to 60 percent. Already, more than half of the world's population lives within 100 kilometers of a coastline, primarily in towns and cities, putting special pressure on fragile and essential coastal and estuarine ecosystems.*

Security and Conflict Prevention: *More than half the world's population lives in over 250 river basins that are shared across international boundaries, and dozens of other nations share coastlines and coastal waters. Disputes among countries over limited freshwater supplies or marine resources already occur, and will likely increase in the future. Internal to individual nations, civil strife can be exacerbated by disputes over water resources, while effective management tools can also create many opportunities for cooperation in otherwise tense political environments.*

The USAID Water Team Commitment

IWRM considers impacts beyond a single activity.

IN practice, the realization of integrated sustainable development and IWRM can only be achieved by numerous specific actions of individuals, communities, businesses, and governments. IWRM is a laudable ideal that must fit with the reality faced by Missions struggling to meet multiple development objectives—often with shrinking budgets. The USAID Water Team is ready to support projects at all levels and all scales, while helping ensure that they are consistent with the principles of integrated management that take into account causes and effects beyond the narrow ends of a single activity. The Water Team makes the following commitments:

- We are here to respond to your needs and to help you think through a feasible path from where you are today in the area of water resources management, to where you would like to be over the long term.
- We are prepared to assist with project design for both incremental/small-scale and more comprehensive programs in all sectors of water use and management. We can also provide support to Mission long-term strategic planning and help develop scopes of work for activities at all scales.
- We are able to link Missions with contractors, grantees, and other public and private institutions that can provide necessary expertise for project design or execution.
- We recognize the wealth of experience throughout the Agency and are committed to extracting "lessons learned" and promoting learning across programs, Bureaus, and Missions in the area of integrated water and coastal resources management.

We look forward to working with you!

For more information on the USAID Water Team contact:

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